

# SEQUENCE LISTING

<110> KYOWA HAKKO KOGYO CO., LTD.

<120> F<sub>0</sub>F<sub>1</sub>-ATPase polypeptides and their genes

<130> 11329US1

<150> JP 2000-234317

<151> 2000-08-02

<160> 21

<170> PatentIn version 2.1

<210> 1

<211> 304

<212> PRT

<213> Corynebacterium ammoniagenes

<400> 1

Met Cys Asp Gly Val Arg Ser Cys Asp Arg Glu Phe Glu Thr Ser Ile

1

5

10

15

Ala Pro Tyr Asp Val Asp Asn Arg Thr Ala Arg Thr Arg Glu Arg Thr

20

25

30

Leu Ser Val Thr Thr Leu Ala Met Lys Gly Ser Phe His Ala Pro Glu

35

40

45

Leu Asp Pro Glu Phe Phe Pro Gly Gln Tyr Tyr Gly Asp Ile Leu Phe

50

55

60

Asp Asp Val Leu Gly Gly Trp Phe Ala Leu Asp Arg Ile Met Leu Val

65

70

75

80

Arg Leu Leu Met Thr Ala Val Leu Val Leu Leu Phe Ile Ala Ala Phe  
85 90 95

Arg Asn Pro Lys Leu Val Pro Lys Gly Leu Gln Asn Val Ala Glu Tyr  
100 105 110

Ala Leu Asp Phe Val Arg Ile His Ile Ala Glu Asp Ile Leu Gly Lys  
115 120 125

Lys Glu Gly Arg Arg Phe Leu Pro Leu Leu Ala Ala Ile Phe Phe Gly  
130 135 140

Thr Leu Phe Trp Asn Val Ser Thr Ile Ile Pro Ala Leu Asn Ile Ser  
145 150 155 160

Ala Asn Ala Arg Ile Gly Met Pro Ile Val Leu Ala Gly Ala Ala Tyr  
165 170 175

Ile Ala Met Ile Tyr Ala Gly Thr Lys Arg Tyr Gly Phe Gly Lys Tyr  
180 185 190

Val Lys Ser Ser Leu Val Ile Pro Asn Leu Pro Pro Ala Leu His Leu  
195 200 205

Leu Val Val Pro Ile Glu Phe Phe Ser Thr Phe Ile Leu Arg Pro Val  
210 215 220

Thr Leu Ala Ile Arg Leu Met Ala Asn Phe Leu Ala Gly His Ile Ile  
225 230 235 240

Leu Val Leu Leu Tyr Ser Ala Thr Asn Phe Phe Phe Trp Gln Leu Asn  
245 250 255

Gly Trp Thr Ala Met Ser Gly Val Thr Leu Leu Ala Ala Val Leu Phe  
260 265 270

Thr Val Tyr Glu Ile Ile Ile Ile Phe Leu Gln Ala Tyr Ile Phe Ala  
275 280 285

Leu Leu Thr Ala Val Tyr Ile Glu Leu Ser Leu His Ala Asp Ser His  
290 295 300

<210> 2

<211> 79

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 2

Met Asn Asp Ile Ile Leu Ala Gln Ala Thr Glu Thr Ser Phe Asp Gly  
1 5 10 15

Leu Gln Ser Ile Gly Tyr Gly Leu Ala Thr Ile Gly Pro Gly Leu Gly  
20 25 30

Ile Gly Ile Leu Val Gly Lys Thr Val Glu Gly Met Ala Arg Gln Pro  
35 40 45

Glu Met Ala Gly Gln Leu Arg Thr Thr Met Phe Leu Gly Ile Ala Phe  
50 55 60

Val Glu Ala Leu Ala Leu Ile Gly Leu Val Ala Gly Phe Leu Phe  
65 70 75

<210> 3

<211> 189

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 3

Met Asn Asn Val Phe Tyr Tyr Leu Ala Ala Glu Gly Glu Ser Leu Pro

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Leu Glu Gly Gly Asn Ser Leu Leu Phe Pro Lys Ser Tyr Asp Ile Val			
20	25	30	
Trp Ser Leu Ile Pro Phe Leu Ile Ile Leu Ile Val Phe Ala Met Phe			
35	40	45	
Val Ile Pro Lys Phe Gln Glu Leu Leu Gln Glu Arg Glu Asp Arg Ile			
50	55	60	
Glu Gly Gly Ile Lys Arg Ala Glu Ala Gln Gln Ala Glu Ala Lys Ala			
65	70	75	80
Ala Leu Glu Lys Tyr Asn Ala Gln Leu Ala Asp Ala Arg Ala Glu Ala			
85	90	95	
Ala Glu Ile Arg Glu Gln Ala Arg Glu Arg Gly Lys Gln Ile Glu Ala			
100	105	110	
Glu Ala Lys Thr Gln Ala Glu Glu Glu Ala Arg Arg Ile Val Ala Gly			
115	120	125	
Gly Glu Lys Gln Leu Glu Ala Ser Arg Ala Gln Val Val Ala Glu Leu			
130	135	140	
Arg Ser Asp Ile Gly Gln Asn Ser Ile Asn Leu Ala Glu Lys Leu Leu			
145	150	155	160
Gly Gly Glu Leu Ser Glu Ser Thr Lys Gln Ser Ser Thr Ile Asp Asn			
165	170	175	
Phe Leu Ser Glu Leu Asp Ser Val Ala Ser Ala Gly Lys			
180	185		

<210> 4

<211> 271

<212> PRT

<213> Corynebacterium ammoniagenes

<400> 4

Met Lys Ala Ala Ser Arg Glu Ser Leu Ala Ser Ala Thr Glu Ser Leu  
1 5 10 15

Asp Ser Asn Leu Ala Ala Gln Ala Gly Val Ala Val Ser Thr Met Thr  
20 25 30

Gly Met Glu Leu Phe Glu Val Ser Gln Val Leu Gly Asp Asp Arg Glu  
35 40 45

Leu Arg Gly Ala Val Ile Asp Glu Ser Ala Ser Thr Glu Ser Arg Lys  
50 55 60

Lys Leu Val Asn Asp Leu Phe Gly Ala Lys Val Ser Pro Ala Thr Leu  
65 70 75 80

Gln Val Leu Glu Gln Ile Ala Ser Ser Lys Trp Ser Ser Ala Arg Glu  
85 90 95

Met Val Ser Gly Leu Ile Ala Leu Ser Arg Arg Ala Leu Met Arg Gly  
100 105 110

Ala Glu Ser Glu Gly Gln Leu Gly Gln Val Glu Asp Glu Leu Phe Arg  
115 120 125

Leu Ser Arg Ile Leu Asp Arg Glu Gly Glu Leu Thr Gln Leu Leu Ser  
130 135 140

Asp Arg Ala Ala Glu Pro Ala Arg Lys Arg Lys Leu Leu Ala Asp Val  
145 150 155 160

Leu Tyr Gly Lys Val Thr Lys Phe Thr Glu Ala Leu Ala Leu Gln Val  
165 170 175

Ile Asp Arg Pro Glu His Asn Pro Ile Asp Asp Ile Ala Asn Leu Ala  
180 185 190

Ala Glu Ala Ala Gln Leu Gln Gly Arg Thr Val Ala His Val Val Ser  
195 200 205

Ala Gly Glu Leu Asn Glu Gly Gln Gln Ala Val Leu Ala Glu Lys Leu  
210 215 220

Gly Lys Ile Tyr Gly Arg Ala Met Ser Ile His Ser Glu Val Asp Thr  
225 230 235 240

Ser Leu Leu Gly Gly Met Thr Ile Arg Val Gly Asp Glu Val Ile Asp  
245 250 255

Gly Ser Thr Ala Gly Lys Ile Glu Arg Leu Arg Thr Ala Leu Lys  
260 265 270

<210> 5

<211> 546

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 5

Met Ala Glu Leu Thr Ile Ser Ser Asp Glu Ile Arg Ser Ala Ile Ala  
1 5 10 15

Asn Tyr Thr Ser Ser Tyr Ser Ala Glu Ala Ser Arg Glu Glu Val Gly  
20 25 30

Val Val Ile Ser Ala Ala Asp Gly Ile Ala Gln Val Ser Gly Leu Pro  
35 40 45

Ser Val Met Ala Asn Glu Leu Leu Glu Phe Pro Gly Gly Val Ile Gly  
50 55 60

Val Ala Gln Asn Leu Glu Thr Asn Ser Ile Gly Val Val Ile Leu Gly  
65 70 75 80

Asn Tyr Glu Ser Leu Lys Glu Gly Asp Gln Val Lys Arg Thr Gly Glu  
85 90 95

Val Leu Ser Ile Pro Val Gly Glu Glu Phe Leu Gly Arg Val Ile Asn  
100 105 110

Pro Leu Gly Gln Ala Ile Asp Gly Leu Gly Pro Ile Ala Gly Glu Glu  
115 120 125

Asp Arg Val Leu Glu Leu Gln Ala Pro Ser Val Leu Gln Arg Gln Pro  
130 135 140

Val Glu Glu Pro Met Gln Thr Gly Ile Lys Ala Ile Asp Ala Met Thr  
145 150 155 160

Pro Ile Gly Arg Gly Gln Arg Gln Leu Ile Ile Gly Asp Arg Lys Thr  
165 170 175

Gly Lys Thr Ala Val Cys Ile Asp Thr Ile Leu Asn Gln Lys Ala Asn  
180 185 190

Trp Glu Ser Gly Asp Lys Asn Lys Gln Val Arg Cys Ile Tyr Val Ala  
195 200 205

Ile Gly Gln Lys Gly Ser Thr Ile Ala Gly Val Arg Lys Thr Leu Glu  
210 215 220

Glu Gln Gly Ala Leu Glu Tyr Thr Thr Ile Val Ala Ala Pro Ala Ser  
225 230 235 240

Asp Ser Ala Gly Phe Lys Trp Leu Ala Pro Phe Ser Gly Ala Ala Leu  
245 250 255

Gly Gln His Trp Met Tyr Gln Gly Asn His Val Leu Val Ile Tyr Asp  
260 265 270

Asp Leu Thr Lys Gln Ala Glu Ala Tyr Arg Ala Ile Ser Leu Leu Leu  
275 280 285

Arg Arg Pro Pro Gly Arg Glu Ala Tyr Pro Gly Asp Val Phe Tyr Leu  
290 295 300

His Ser Arg Leu Leu Glu Arg Ala Ala Lys Leu Ser Asp Asp Leu Gly  
305 310 315 320

Ala Gly Ser Leu Thr Ala Leu Pro Ile Ile Glu Thr Lys Ala Asn Asp  
325 330 335

Val Ser Ala Phe Ile Pro Thr Asn Val Ile Ser Ile Thr Asp Gly Gln  
340 345 350

Val Phe Leu Glu Ser Asp Leu Phe Asn Gln Gly Val Arg Pro Ala Ile  
355 360 365

Asn Val Gly Val Ser Val Ser Arg Val Gly Gly Ala Ala Gln Thr Lys  
370 375 380

Gly Met Lys Lys Val Ala Gly Asn Leu Arg Leu Asp Leu Ala Ser Tyr  
385 390 395 400

Arg Asp Leu Gln Gly Phe Ala Ala Phe Ala Ser Asp Leu Asp Pro Val  
405 410 415

Ser Lys Ala Gln Leu Glu Arg Gly Glu Arg Leu Val Glu Ile Leu Lys  
420 425 430



Gln Ser Glu Ser Ser Pro Gln Ala Val Glu Tyr Gln Met Val Ser Ile  
435 440 445

Phe Leu Ala Glu Glu Gly Val Phe Asp Val Val Pro Val Glu Asp Val  
450 455 460

Arg Arg Phe Glu Ala Asp Val Gln Glu Tyr Leu Gln Gln Asn Thr Pro  
465 470 475 480

Glu Val Tyr Glu Gln Ile Ala Gly Gly Lys Ala Phe Thr Asp Glu Ser  
485 490 495

Lys Glu Ala Leu Leu Ala Ala Ala Lys Asp Phe Thr Pro Ser Phe Arg  
500 505 510

Thr Thr Glu Gly His Asn Leu Gly Thr Glu Ala Pro Val Asp Pro Leu  
515 520 525

Ala Glu Glu Glu Val Lys Lys Thr Glu Val Thr Val Ser Arg Lys Ser  
530 535 540

Ala Lys  
545

<210> 6

<211> 327

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 6

Met Ala Asn Leu Arg Glu Leu Arg Asp Arg Ile Arg Ser Val Asn Ser  
1 5 10 15

Thr Lys Lys Ile Thr Lys Ala Gln Glu Leu Ile Ala Thr Ser Arg Ile

20

25

30

Thr Lys Ala Gln Ala Lys Val Asp Ala Ala Ala Pro Tyr Ala His Glu

35

40

45

Met Ser Asn Met Met Asp Arg Leu Ala Ser Ala Ser Ser Leu Glu His

50

55

60

Pro Met Leu Arg His Arg Glu Asn Gly Lys Val Ala Ala Val Leu Val

65

70

75

80

Val Ser Ser Asp Arg Gly Met Cys Gly Gly Tyr Asn Asn Asn Val Phe

85

90

95

Lys Lys Ala Ala Glu Leu Glu Gly Leu Leu Arg Gly Gln Gly Phe Asp

100

105

110

Val Val Arg Tyr Val Thr Gly Ser Lys Gly Val Gly Tyr Tyr Asn Phe

115

120

125

Arg Glu Lys Glu Val Val Gly Ala Trp Thr Gly Phe Ser Gln Asp Pro

130

135

140

Ser Trp Glu Gly Thr His Asp Val Arg His His Leu Val Asp Gly Phe

145

150

155

160

Ile Ala Gly Ser Glu Gly Thr Thr Pro Ala Arg Gln Gly Val Asn Thr

165

170

175

Glu Asp Gln Thr Val Arg Gly Phe Asp Gln Val His Val Val Tyr Thr

180

185

190

Glu Phe Glu Ser Met Leu Val Gln Thr Pro Arg Ala His Gln Leu Leu

195

200

205

Pro Ile Glu Pro Val Ile Lys Glu Glu Glu Leu His Leu Gly Asp Ser

210

215

220

Ala Leu Glu Ala Asn Pro Asp Ala Gln Gly Leu Ser Ala Asp Tyr Glu

225

230

235

240

Phe Glu Pro Asp Ala Asp Thr Leu Leu Ser Ala Leu Leu Pro Gln Tyr

245

250

255

Val Ser Arg Ile Leu Phe Ser Met Phe Leu Glu Ala Ser Ala Ser Glu

260

265

270

Ser Ala Ala Arg Arg Thr Ala Met Lys Ala Ala Thr Asp Asn Ala Asn

275

280

285

Asp Leu Val Thr Asp Leu Ser Arg Val Ala Asn Gln Ala Arg Gln Ala

290

295

300

Gln Ile Thr Gln Glu Ile Thr Glu Ile Val Gly Gly Ala Gly Ala Leu

305

310

315

320

Ala Glu Ser Ala Glu Ser Asp

325

&lt;210&gt; 7

&lt;211&gt; 481

&lt;212&gt; PRT

&lt;213&gt; Corynebacterium ammoniagenes

&lt;400&gt; 7

Met Thr Thr Ala Leu His Glu Gln Asn Thr Gln Glu Ser Ala Ile Ala

1

5

10

15

Gly Arg Val Val Arg Val Ile Gly Pro Val Val Asp Val Glu Phe Pro

20

25

30

Arg Gly Gly Leu Pro Ala Leu Tyr Asn Ala Leu Thr Val Glu Ile Asn  
 35 40 45

Leu Glu Ser Val Ala Arg Thr Ile Thr Leu Glu Val Ala Gln His Leu  
 50 55 60

Gly Asp Asn Leu Val Arg Thr Val Ser Met Ala Pro Thr Asp Gly Leu  
 65 70 75 80

Val Arg Arg Ala Ala Val Thr Asp Thr Glu Ala Pro Ile Ser Val Pro  
 85 90 95

Val Gly Asp Val Val Lys Gly His Val Phe Asn Ala Leu Gly Asp Cys  
 100 105 110

Leu Asp Glu Pro Gly Leu Gly Arg Asp Gly Glu Gln Trp Gly Ile His  
 115 120 125

Arg Glu Pro Pro Ala Phe Asp Gln Leu Glu Gly Lys Thr Glu Ile Leu  
 130 135 140

Glu Thr Gly Ile Lys Val Ile Asp Leu Leu Thr Pro Tyr Val Lys Gly  
 145 150 155 160

Gly Lys Ile Gly Leu Phe Gly Gly Ala Gly Val Gly Lys Thr Val Leu  
 165 170 175

Ile Gln Glu Met Ile Thr Arg Ile Ala Arg Glu Phe Ser Gly Thr Ser  
 180 185 190

Val Phe Ala Gly Val Gly Glu Arg Thr Arg Glu Gly Thr Asp Leu Phe  
 195 200 205

Leu Glu Met Glu Glu Met Gly Val Leu Gln Asp Thr Ala Leu Val Phe  
 210 215 220

Gly Gln Met Asp Glu Pro Pro Gly Val Arg Met Arg Val Ala Leu Ser  
225 230 235 240

Gly Leu Thr Met Ala Glu Tyr Phe Arg Asp Val Gln Asn Gln Asp Val  
245 250 255

Leu Leu Phe Ile Asp Asn Ile Phe Arg Phe Thr Gln Ala Gly Ser Glu  
260 265 270

Val Ser Thr Leu Leu Gly Arg Met Pro Ser Ala Val Gly Tyr Gln Pro  
275 280 285

Thr Leu Ala Asp Glu Met Gly Val Leu Gln Glu Arg Ile Thr Ser Thr  
290 295 300

Lys Gly Lys Ser Ile Thr Ser Leu Gln Ala Val Tyr Val Pro Ala Asp  
305 310 315 320

Asp Tyr Thr Asp Pro Ala Pro Ala Thr Thr Phe Ala His Leu Asp Ala  
325 330 335

Thr Thr Glu Leu Asp Arg Ala Ile Ala Ser Lys Gly Ile Tyr Pro Ala  
340 345 350

Val Asn Pro Leu Ser Ser Thr Ser Arg Ile Leu Glu Pro Ser Ile Val  
355 360 365

Gly Glu Arg His Tyr Ala Val Ala Gln Arg Val Ile Asn Ile Leu Gln  
370 375 380

Lys Asn Lys Glu Leu Gln Asp Ile Ile Ala Ile Leu Gly Met Asp Glu  
385 390 395 400

Leu Ser Glu Glu Asp Lys Ile Thr Val Gln Arg Ala Arg Arg Ile Glu  
405 410 415

Arg Phe Leu Gly Gln Asn Phe Phe Val Ala Glu Lys Phe Thr Gly Leu  
420 425 430

Pro Gly Ser Tyr Val Pro Leu Ala Asp Thr Ile Asp Ala Phe Glu Arg  
435 440 445

Ile Cys Asn Gly Glu Phe Asp His Tyr Pro Glu Gln Ala Phe Asn Gly  
450 455 460

Leu Gly Gly Leu Asp Asp Val Glu Ala Ala Tyr Lys Lys Leu Thr Glu  
465 470 475 480

Lys

<210> 8

<211> 123

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 8

Met Ala Asp Ile Thr Val Glu Leu Val Ser Val Glu Arg Met Leu Trp  
1 5 10 15

Ser Gly Lys Ala Thr Ile Ile Ser Ala Glu Thr Thr Glu Gly Glu Ile  
20 25 30

Gly Val Leu Pro Gly His Glu Pro Leu Leu Gly Gln Leu Ala Glu Asn  
35 40 45

Gly Val Val Thr Phe Arg Pro Val Asp Gly Asp Arg Lys Val Ala Ala  
50 55 60

Val Gln Gly Gly Phe Leu Ser Val Ser Thr Glu Lys Ile Thr Val Leu  
65 70 75 80

Ala Asp Trp Ala Val Trp Ala Asp Glu Val Asn Glu Ser Gln Ala Gln  
85 90 95

Glu Asp Ala Leu Ser Ser Asp Glu Leu Val Ser Ser Arg Gly Gln Ala  
100 105 110

Ala Leu Arg Ala Leu Ala Arg Ser Arg Glu Ser  
115 120

<210> 9

<211> 912

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 9

atgtgcgacg gagtcgtag ctgtgacaga gagtttgaga cgtccatcgc accgtacgac 60  
gtcgacaatc gtacggcccg aacacgggag agaacgctga gcgttacaac attggccatg 120  
aagggtagct tccacgcgcc cgaactggac ccagaatttt tcccggggca atattacggc 180  
gacatcctgt tcgacgatgt gttgggcgga tggttcgac ttgatcgcat catgctggtt 240  
cgtctgttga tgaccgcctt cttggtgctt ttatttattg cagcatttag gaacccaaag 300  
ctggttcta agggactaca gaacgtcgca gaatacgcgt tagatttcgt ccgaattcac 360  
attgctgagg acatcctggg caagaaggag gtcgctcgt tcctaccgtt gctggcggct 420  
atcttcttcg gcaccctttt ctggaacgtc tccacgatta ttccggcact gaacatctcc 480  
gcaaacgctc gtattggcat gcctattgtc ttggtggcg cagcgtatat cgcaatgatt 540  
tacgcaggca ccaagcgcta tggcttcggt aagtagtca agtcgtcgtt ggttattcct 600

aaccttccac cggtttgca cttgctgggt gtccaattg agtttttctc gaccttcac 660  
 ttgcgtcccg tcactctggc aattcgtctt atggcgaact tccttgccgg ccacatcatt 720  
 ttggttctgc tgtactctgc caggaacttc ttcttctggc agctcaacgg ctggacagcg 780  
 atgtccgggtg tgacctgct cgcagcgggt ctgtttacgg tctacgagat catcatcatc 840  
 ttctgcagg catacatctt tgctctgctg acggcgggtg acatcgagtt gtcacttcac 900  
 gcagactcgc ac 912

<210> 10  
 <211> 237  
 <212> DNA  
 <213> *Corynebacterium ammoniagenes*

<400> 10  
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 ggctacggcc ttgcaaccat cgccctggc ttgggtattg gtatcctcgt cggcaagacc 120  
 gttgagggca tggcagtcg gctgagatg gctggccagc tgcgtaccac catgttcttg 180  
 ggtatgcct tcgttgaggc tcttgcaatt atcgccctgg ttgcaggctt cctgttc 237

<210> 11  
 <211> 567  
 <212> DNA  
 <213> *Corynebacterium ammoniagenes*

<400> 11  
 atgaacaacg tcttttacta tcttgacgc gaaggagagt cccttcact ggaaggtggc 60



aactcccttc tgtttcccaa gagctatgac atcgtctggt ctctgatecc gttcttaate 120  
atccttattg tcttcgcaat gtttgtcatt ccgaagtcc aggaactgtt gcaagagcgt 180  
gaagaccgga ttgaggcgcg catcaagcgc gctgaagccc aacaggcaga agcaaaggcc 240  
gcacttgaga agtacaacgc acagctagct gacgctcgcg cagaggcagc tgaaatccgt 300  
gagcaggcgc gtgagcgcg caagcagatt gaagcagagg caaagacca ggcagaggaa 360  
gaagcacgcc gtatcgtcgc aggtggcgaa aacagcttg aagcttccc cgcacaggta 420  
gttgctgaac tgcgttcga tatcgacag aactccatca acttggtga gaagctgctc 480  
ggcgggtgaac tctctgagtc caccaagcag tcttcaacca ttgataactt cctgtccgag 540  
ctcgactctg tggcatcggc cggaaag 567

<210> 12

<211> 813

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 12

atgaaggcag ctagccgca atcgtcgca tccgctaccg agtcgctgga ttccaatctg 60  
gcagctcaag caggtgtagc agtgtccacc atgaccggca tggaactgtt cgaggtttcc 120  
caagtattgg gtgatgaccg cgaactccgt ggagcagtca ttgatgaatc tgcttccact 180  
gaatcccgca agaagctcgt taatgatctc ttcgggtgcca aagtttctcc tgctaccttg 240  
caggttctgg aacagattgc atcgtcgaag tggtcgagcg cccgcgagat ggtttccgga 300  
ctgategctc tttcacgtcg tgctttgatg cgcggcgagc aaagcgaagg acaactagga 360

caggtcgaag atgaactctt ccgcttgtcc cggatcctgg accgcaagg cgaactcacc 420  
 cagctgcttt ctgaccgagc tgcagaacct gcgcgtaagc gcaagttgct ggcagatgtg 480  
 ctttacggaa aggtcaccaa attcactgag gcgcttgccg tgcaggtgat tgaccgccct 540  
 gagcacaatc ccattgatga cattgcgaat ctggcggctg aagcagcaca gcttcagggt 600  
 cgcactgttg cgcacgttgt tagtgccggg gaactcaatg aaggccagca ggcagtactc 660  
 gccgagaagc tgggcaagat ttatggctgt gcgatgtcca tccactctga ggttgacacc 720  
 agcctcctcg gtggtatgac aatccgcgta ggcatgaag ttattgacgg ttctaccgca 780  
 ggcaaaattg agcgctgcg taccgctttg aag 813

<210> 13

<211> 1638

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 13

atggcggagc tgacgatctc ctccgatgag atccgtagcg cgatagcgaa ctacacctcg 60  
 agctactccg cggaggcctc ccgtgaggag gtcggcgtgg tcatttcggc agctgacggg 120  
 attgcacagg tttctgggct accttcagtt atggcgaatg agctgctcga gttccctggc 180  
 ggcgtaatcg gcgtgcaca aaaccttgaa accaactcca ttggcgttgt tattcttggt 240  
 aactacgagt ccctcaaaga aggcgaccaa gttaagcgaa ctggcgaagt tctctccatc 300  
 ccagtgggtg aagagttcct cggccgcgtt attaaccat tgggtcaggc aattgacggc 360

ctgggccc aa tcgctggcga agaggaccgc gtcctcgagc tgcaggcacc ttccgtgttg 420  
 cagcgtcagc cagttgaaga gccaatgcag accggcatca aggctattga tgctatgacc 480  
 ccaatcggtc gcggtcagcg tcagctcadc attggtgacc gtaagactgg taaaaccgca 540  
 gtctgcatcg acaccatcct taaccagaag gctaactggg aatccggcga caagaacaag 600  
 caagttcgtt gtatctacgt cgctattggc cagaagggtt ccaccatcgc tgggtgccgc 660  
 aagaccctcg aagagcaggc cgctctggag tacaccacca tcgtggctgc tectgtttct 720  
 gactccgcgg gttcaagtg gttggcacca ttctccggcg ctgctcttgg tcagcactgg 780  
 atgtaccagg gcaaccacgt cttggtcadc tatgatgact tgaccaagca ggctgaggct 840  
 taccgtcga tttccctgtt gctgcgtcgc ccgccgggccc gcgaagctta cccaggtgac 900  
 gtctttctact tgcactcccg tctgctggag cgtgctcga agctctccga tgatttgggt 960  
 gcaggttctt tgaccgcact gccattatt gaaaccaagg cgaatgacgt gtctgcgttc 1020  
 attccaacca acgttatttc cattaccgac ggccaggctt tectggagtc cgacctgttc 1080  
 aaccaaggcg tccgtccggc aattaacgtc ggtgtgtcgg tttccgtgt tgggtggcgt 1140  
 gctcagacca aggttatgaa gaaggttgca ggtaacctgc gtcttgacct cgcttctac 1200  
 cgtgatctgc agggctttgc tgccttcgct tctgacttgg acccagtgtc caaggcccag 1260  
 cttgagcgcg gtgagcgtct ggttgagatc ctgaagcagt ctgagtcttc tctcaggca 1320  
 gtcgagtacc agatggtttc catcttcttg gctgaagaag gcgtcttcga cgctgttctt 1380  
 gtcgaagatg ttcgtcgtt tgaggctgac gttcaggaat acctgcagca gaacacccca 1440

gaggtttacg agcagattgc cggcggtaag gcatttaccg acgagtccaa ggaagccctg 1500  
 ttggctgcag ctaaggactt cactccttcc ttccgcacca ccgagggcca caacttgggc 1560  
 actgaagctc cagttgatcc tttggctgaa gaagaagtca agaagactga agtcaccgtc 1620  
 tcccgtaagt cggctaag 1638

<210> 14

<211> 981

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 14

atggcaaate ttgcgaatt gcgcgaccgt atccggtccg tgaactcgac caagaagatc 60  
 accaaggcgc aggagctgat tgcaacttct cgcattacca aggcgcaagc caaggttgat 120  
 gcagcagcac cgtacgcaca cgagatgtcg aacatgatgg accgtcttgc atcggttagc 180  
 tcgttggagc acccaatgct gcgccaccgt gaaaacggca aagttgcagc cgtactcgtg 240  
 gtctcttctg accgcggtat gtgtggtggc tacaacaaca acgtctttaa gaaggctgct 300  
 gagctegaag gactccttcg cggtaagge ttcgacgttg tccgctacgt aaccggtagc 360  
 aaggcgctcg gctactacaa ctcccgtag aggaagttg tgggcgcgtg gactggcttt 420  
 tctcaggatc cgtcctggga aggcactcac gacgttcgtc accacttggt tgacggcttc 480  
 attgctggct ccgaaggtag aactccggcc cgtcaggggc tgaacaccga agaccaaagc 540  
 gtacgtggtt tcgaccaggt acacgttggt tacaccgagt tcgaatccat gctggttcag 600  
 actccacgtg ctcaccagtt gttgccgatt gaaccggtaa ttaaagaaga ggaacttcac 660

ctgggcgact cggcgctaga agccaaccct gatgctcagg gcctgtctgc tgactacgag 720  
 tttagccgg atgcagatac ttgctctcg gcattctgc cgcagtatgt atcacgtatc 780  
 cttttctcga tgttcttga ggcttcggct tctgagtcg cagctcgctg aactgcaatg 840  
 aaggctgcga ctgacaacgc taatgacttg gtaaccgact tgtctcgtgt tgctaaccag 900  
 gctcgtcagg cgcagattac ccaggaaatc acagaaatcg tcggtggcgc tggcgcgctc 960  
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<210> 15

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<213> Corynebacterium ammoniagenes



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